REMARKS

Reconsideration and further examination of the subject patent application in light of the present Amendment and Remarks is respectfully requested.

Claims Objections

Claims 6, 14 and 22 have been objected to for the absence of a period. In response, periods have been added.

Rejections under 35 U.S.C. §102

Claim 24 has been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Pat. No. 6,115,446 to Pan. Applicant respectfully traverses this rejection.

In response, claim 24 has been further limited to "filtering the linear combination of complementary data elements in the spatial domain to avoid interpolation of the linear combination." Support for this further limitation is provided by the fact that "Filtering in that spatial domain may be accomplished with the use of a shift variant filter 28" (Specifiction, par. [0044]) and upon the use of "a shift-variant filtration scheme to avoid interpolation" (Specification, par. [0112].

In contrast, Pan uses "a multidimensional interpolator 10 . . . to interpolate between sampling spaces" (Pan, col. 2, lines 27-31). However, "the previous hybrid algorithm invokes a 1D interpolation along γ for estimating the discrete parallel-beam sinogram on uniform grids along ξ. Such a 1D interpolation may result in reduced image resolution in situations where fan-

beam samples along γ are sparse" (Specification, par. [0039]).

As set forth "Inspection of Eqs. (1) and (11) indicates that the function $g(\gamma_0, \gamma)$ changes the shift-invariant filtration in the FFBP algorithm into a shift-variant filtration in the new hybrid algorithm" (Specification, par. [0040]). Further, "Images obtained with the new hybrid algorithm . . . have a better resolution than do images obtained with the previous hybrid algorithm because the former can avoid the 1D linear interpolation (see Eq. (18)) that is used in the latter" (Specification, par. [0061]).

Since claim 24 operates by "filtering the linear combination of complementary data elements in the spatial domain to avoid interpolation of the linear combination", Pan does not do the same or any similar thing as that of the claimed invention. Since Pan does not do the same or any similar thing as that of the claimed invention, the rejection is improper and should be withdrawn.

Rejections under 35 U.S.C. §103

Claims 1, 2, 5-10, 13-18 and 21-23 stand rejected under 35 U.S.C. §103a) as being obvious over U.S. Pat. No. 5,406,479 to Harman in view of Defrise ("A CONE-BEAM RECONSTRUCTION ALGORITHM USING SHIFT VARIANT FILTERING AND CONE-BEAM BACKPROJECTION"). Applicant respectfully traverses this rejection.

In response, independent claims 1, 9 and 17 have been further limited to the method step of (and apparatus for) "performing a shift variant filtration of the parallel-beam data to avoid interpolation of the parallel-beam data." Support for the use of "a shift-variant filtration scheme to avoid interpolation" is found in paragraph [0112] of the specification.

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It may be noted first, in this regard, that Harman is based upon the use of an interpolation filter (Harman, col. 11, lines 26-29; see also FIG. 6), not a shift variant filter as asserted by the Office Action (page 6). The interpolation filter of Harmon is applied to parallel beam data (Harman, col. 12, lines 16-21).

It may be noted next that Defrise does not use shift-variant filters on parallel beam data as under the claimed invention. Since Defrise does not use shift-variant filters on parallel beam data, the shift-variant filter of Defrise are not the same as that of the claimed invention.

For example, the Office Action's reference within Defrise is to Section II-D, entitled "Cone-Beam Tomography Reconstruction Using Shift-Variant Filtered-Backprojection." The three steps of the Defrise reconstruction include: "Step 1. . . . calculate Grangeat's intermediate function $S(\theta,\lambda)$ . . . Step 2. Calculate filtered cone-beam data . . . Step 3. Backproject the filtered cone-beam projections onto the 3D image" (Defrise, page 188, right column, lines 17-25). The fact that Defrise calculates "filtered cone-beam data" and backprojects "the filtered cone-beam projections onto the 3D image" clearly establishes that the Defrise shift-variant filter is intended for cone-beam data, not parallel beam data.

Since neither Harman or Defrise apply shift-variant filtering to parallel beam data, the combination fails to teach or suggest each and every claim limitation. Since the combination fails to teach or suggest each and every claim limitation, the rejections are improper and should be withdrawn.

Claims 24, 25, 31, 32, 38 and 39 stand rejected under 35 U.S.C. §103a) as being obvious over Pan in view of Defrise. Applicant respectfully traverses this rejection.

Claim 24 has been further amended, as discussed above. Similarly, independent claims 31

and 38 have been further limited to apparatus for filtering "the linear combination of complementary data elements in the spatial domain to avoid interpolation of the linear combination." Support for the further limitation is provided by the fact that "Filtering in that spatial domain may be accomplished with the use of a shift variant filter 28" (Specifiction, par. [0044]) and upon the use of "a shift-variant filtration scheme to avoid interpolation" (Specification, par. [0112].

It may be noted in this regard that Pan teaches of the use of interpolation of parallel beam data and Defrise teaches shift-varient filtering of cone-beam data. As such, neither reference teaches or suggests shift-variant filtering of parallel beam data.

Since neither Pan or Defrise use shift-variant data on parallel beam data, the combination fails to teach or suggest each and every claim limitation. Since the combination fails to teach or suggest each and every claim limitation, the rejections are improper and should be withdrawn.

Claims 3, 4, 11, 12, 19 and 20 stand rejected under 35 U.S.C. §103a) as being obvious over Harman in view of Defrise and Pan. Applicant respectfully traverses this rejection.

It may be noted in this regard that Harman and Pan interpolate parallel beam data and Defrise teaches shift-varient filtering of cone-beam data. As such, none of the reference teach or suggest shift-variant filtering of parallel beam data.

Since none of the references of Harmon, Pan or Defrise use shift-variant data on parallel beam data, the combination fails to teach or suggest each and every claim limitation. Since the combination fails to teach or suggest each and every claim limitation, the rejections are improper and should be withdrawn.
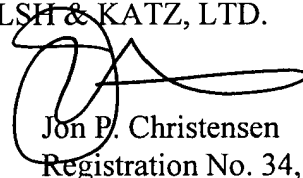
<u>Closing Remarks</u>

For the foregoing reasons, applicant submits that the subject application is in condition

for allowance and earnestly solicits an early Notice of Allowance. Should the Primary Examiner

be of the opinion that a telephone conference would expedite prosecution of the subject

application, the Primary Examiner is respectfully requested to call the undersigned at the below-

listed number.

The Commissioner is hereby authorized to charge any additional fee which may be

required for this application under 37 C.F.R. §§ 1.16-1.18, including but not limited to the issue

fee, or credit any overpayment, to Deposit Account No. 23-0920. Should no proper amount be

enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise

improper or informal, or even entirely missing, the Commissioner is authorized to charge the

unpaid amount to Deposit Account No. 23-0920. A duplicate copy of this sheet(s) is enclosed.

Respectfully submitted,

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By

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